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# Armed Forces Serve Science

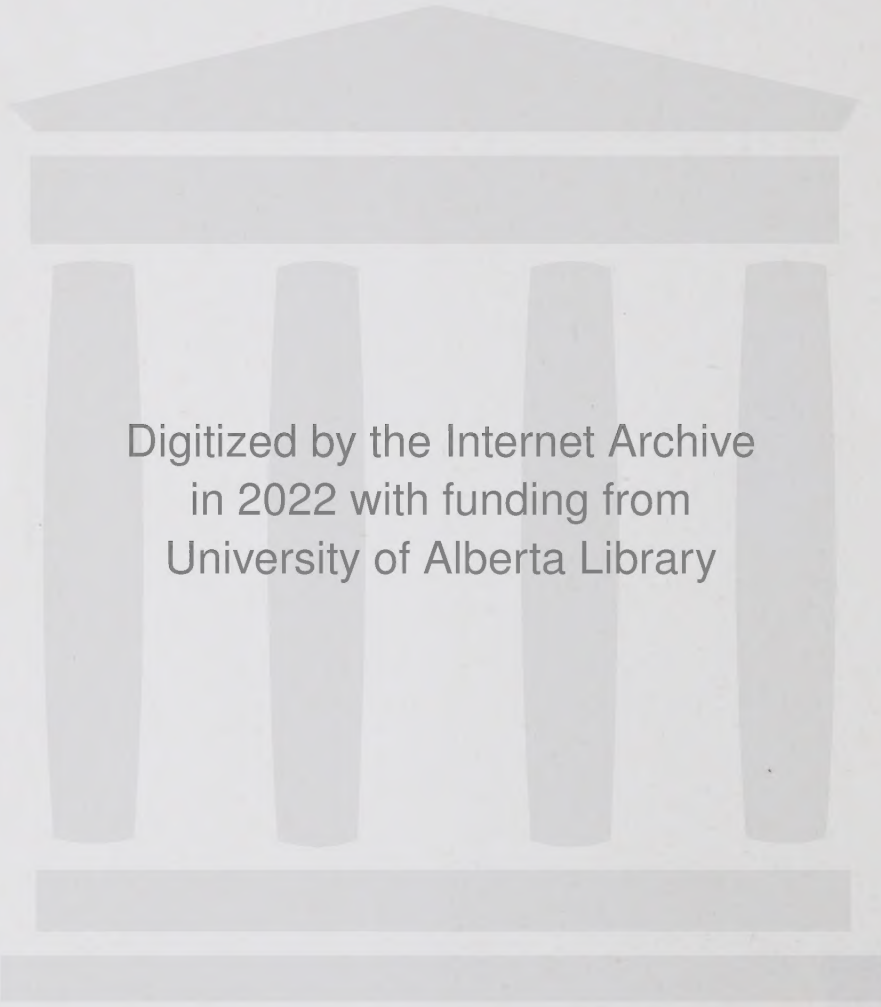
*The story of service participation in the Canadian IGY  
Expedition to Lake Hazen, Northern Ellesmere Island,  
1957-58 by J. P. Croal and J. R. Lotz.*

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# ARMED FORCES SERVE SCIENCE

By

LIEUT.-COMMANDER J. P. CROAL, CD, ROYAL CANADIAN NAVY (RET.),  
AND MR. J. R. LOTZ, DEPARTMENT OF NORTHERN AFFAIRS  
AND NATIONAL RESOURCES\*

One of the outstanding features of the study of the Canadian Arctic in the post-war years has been the importance of the contribution of the armed services to the various scientific studies undertaken there. The interest which various United States service agencies have shown in co-operating in Canadian Arctic studies has also been striking.

Specialists, transport, and supplies provided by the armed forces have greatly aided civilian scientists working in remote areas of the Arctic. The joint Canadian-United States expeditions to the Beaufort and Chukchi Seas between 1948 and 1954, and the vast amount of scientific data gathered during the cruises of HMCS *Labrador* between 1954 and 1957 are examples of the prominent part that the Canadian and United States services have played in the opening up of the Canadian North.

The type of support that the services can best provide was very evident on Operation "Hazen", the Canadian International Geophysical Year Expedition to Lake Hazen in northern Ellesmere Island in 1957

and 1958. The Canadian services were consulted, and freely offered their help at all stages of the operation, much of the success of which was due to the smoothness and efficiency with which the services carried out their assigned duties, and supported the scientific programme. The coordinating agency for Operation "Hazen" was the Defence Research Board's Geophysics Section, which is headed by Mr. T. A. Harwood. The expedition was led by Dr. G. Hattersley-Smith of the Geophysics Section; all the other scientists were drawn from Universities and from other government departments.

The association of scientists and servicemen on Operation "Hazen" was mutually beneficial. The logistics of establishing a scientific station entirely by air in a high latitude provided useful training for everyone involved. Long hours of flying by the Royal Canadian Air Force in remote and difficult areas, where landings had not previously been made, gave air crews valuable flying experience. Service food, clothing and equipment were tested in the field, and in some cases suggestions for improvement were made.

Very little was known about northern Ellesmere Island before Operation "Hazen". The British Arctic Expedition of 1875-76 had explored the northern coast of the island, but had not penetrated far inland. It was left for Adolphus Greely, the leader of the ill-fated Lady Franklin Bay Expedition of 1881-84, to dis-

\*Lieut.-Commander Croal, previously seconded to the Defence Research Board for special duties, has had varied Arctic experience over a number of years. Recently retired from the RCN, he is now employed by Spartan Air Services Ltd. on special projects, which include work in the Arctic. Mr. Lotz was formerly employed by McGill University and DRB before joining the Department of Northern Affairs and National Resources where he is now in the Industrial Division. He also served as a research scientist with the Arctic Institute of North America.—Editor.



cover Lake Hazen in the spring of 1882. Before 1957, most of our knowledge of the Lake Hazen area came from the work of the Greely expedition, although other expeditions visited the area.

Between 1900 and 1905, Fort Conger, Greely's base on Discovery Harbour, was used by Peary and members of his expeditions as a base for hunting journeys in the Lake Hazen area. Peary's expeditions brought him to the North Pole from Cape Aldrich, the northernmost point of Canada and some 400 miles distant from the Pole.

The first penetration of the ice cap to the north of Lake Hazen was

made in 1935 by a two-man party of the Oxford University Ellesmere Land Expedition, which was based on Etah in northern Greenland. They sledged up the Gilman Glacier, and reached Mount Oxford. From its top, they saw many isolated mountain peaks, and, rising above the ice on the northern horizon, the outline of a mountain range. But with little food, they were forced to turn back from this point. In 1953 and 1954, the Defence Research Board organized (in 1954 jointly with the United States) two expeditions led by Dr. Hattersley-Smith to study the north coast and the ice shelves of northern Ellesmere Island. These expeditions

owed much of their success to the co-operation of the United States Air Force which transported them into the area.

To the Royal Canadian Air Force went the credit for the first landing on a glacier in the interior of northern, Ellesmere Island. In early March, 1957, W/Cdr. J. G. Showler, AFC, CD, Officer Commanding 408 Squadron, accompanied by Mr. Harwood of the Defence Research Board, landed in a ski-wheel DC-3 ("Dakota") aircraft on Gilman Glacier at an altitude of 4000 feet; a landing was also made on the ice of Lake Hazen, where the light snow cover,



*National Defence Photograph*

Mr. Lotz, co-author of the accompanying article, wearing full Arctic clothing. The dogs shown are some of those used on the expedition.



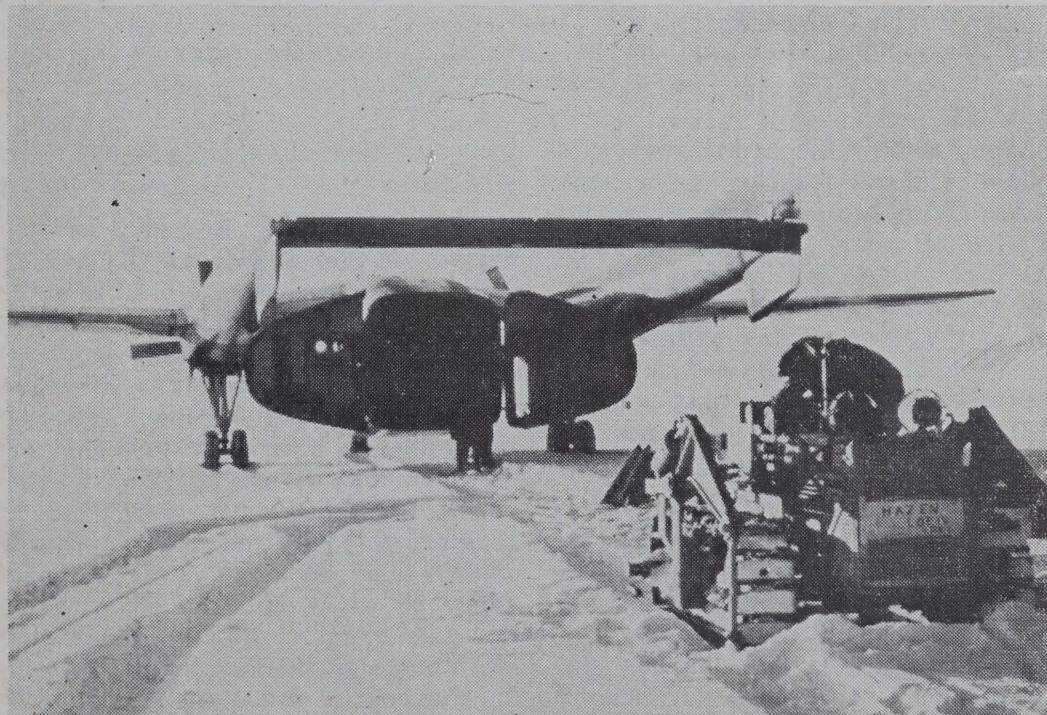
and the calm conditions and absence of snow-drifts suggested that here in the Arctic was a sheltered area of good weather.

During the planning stages of Operation "Hazen", many items of service food, clothing and general stores were sent up to the Defence Research Northern Laboratory, Fort Churchill, the main staging point for the expedition. Clothing and accessories were mainly drawn from the Canadian Army, including olive-drab parkas and windproof trousers, arctic mitts, white mukluks, balaclava helmets and snow-goggles. Tents, rucksacks, light toboggans, thermos bottles and many other items also were supplied by the Army.

Some Army food was supplied in the form of oatmeal bars, shortbread and meat bars, and these formed an

important part of the diet of the expedition. The oatmeal and shortbread bars provided a quick and tasty source of energy on the trail, and one enthusiast vowed his intention of writing a book on "101 Ways to prepare Meat Bars", based on the varieties of use to which he had put this Army food!

Probably the Army's most valuable contribution to Operation "Hazen" was in the person of Sergeant D. Engels, Royal Canadian Engineers. Among a group of scientists not too well endowed with mechanical knowledge, his practical experience and ability with machines was very welcome. He and Mr. Lotz (co-author of this article) were on the first C-119 ("Flying Boxcar") aircraft of Air Transport Command to land on Lake Hazen, at midnight on



*National Defence Photograph*

Sergeant D. Engels, Royal Canadian Engineers, driving the TD9 bulldozer off the first C-119 to land on Lake Hazen in April 1957.





*National Defence Photograph*

Sergeant Engels attaching the winch to a Bombardier oversnow vehicle,  
Lake Hazen, May 1957.

28 April 1957. On board this aircraft was a bulldozer for clearing a landing strip on the lake ice. A second "Flying Boxcar" landed an hour later, carrying the bulldozer blade and winch. These were quickly fitted to the front of the vehicle, and the work of preparing the strip began. Some of the scientists worked at this, while others unloaded the planes and sorted out equipment and supplies.

In continuous daylight, work on the strip went on twenty-four hours a day, despite temperatures as low as  $-20^{\circ}\text{F}$ . In a short time, an airstrip 3500 feet long was cleared. This initial air-lift showed the advantages of the Lake Hazen site. No breath of wind disturbed the air, and the sky remained clear as the "Flying

Boxcars" ferried supplies from Thule Air Base.

The two "Flying Boxcars" of 436 Squadron, Air Transport Command, brought in approximately 35 tons of stores, fuel and equipment, in addition to six scientists and two dog teams. This squadron also flew in an RCAF "Shoran" crew, who set up a station at the western end of Johns Island. Working almost continuously, the two aircrews did a magnificent job, and the important initial task of establishing a base camp by air was achieved without delay or mishap. In all, 10 landings were made on the ice of Lake Hazen. In the end, a small settlement had been developed on the lake, about a mile from its northern shore, and half a mile from Johns Island, where





*National Defence Photograph*

RCAF ski-wheel DC-3 establishing the camp on Gilman Glacier, May 1957.

several pyramid tents, two vehicles, two prefabricated huts, rows of fuel drums, stacks of ration boxes, scientific instruments, and various crates and boxes were scattered. Everything was later moved to the north shore of the lake where the Hazen Camp was set up.

Two members of the expedition were to stay at Hazen Camp, while the other four had to be transported to the Gilman Glacier, where an advance base for working on the ice cap and glaciers was to be established. A ski-wheel "Dakota" of 408 Squadron made three landings at 35,000 feet, some 25 miles north-east of Hazen Camp. Several senior RCAF officers who directed the air operation in 1957 and 1958, went in on the first flight. In addition to the landings by the "Dakota", it was necessary to paratroop a quantity of supplies.

The expedition passed a very successful summer, and studies in glaciology, glacial-meteorology, geo-

physics, geology, survey, and limnology were carried out until early August. On 14 August, the six members of the expedition were waiting at Hazen Camp for the arrival of the winter party. Radio communication was poor during the summer of 1957 because of sun-spots, and the first intimation of the arrival of the relief party came when the roar of a helicopter's engine shattered the silence of the Lake Hazen valley.

As HMCS *Labrador* was engaged in the re-supply of DEW Line stations during the summer of 1957, arrangements were made for the United States Military Sea Transportation Service to support Operation "Hazen". L/Commander Croal, co-author of this article, served as logistics coordinator and liaison officer for the operation, and joined USCGC *Eastwind* at Thule Air Base, Greenland.

Under Captain R. F. Rea, USCG, the icebreaker steamed north from Thule Air Base on 13 August, and



arrived at the head of Chandler Fiord on the 15th. The passage through Smith Sound, Kane Basin, Kennedy Channel and Lady Franklin Bay was made in the fast time of 41 hours, and *Eastwind* became the first ship ever to reach Chandler Fiord. Almost as soon as the ship anchored near the head of the fiord, the work of relief and re-supply began. When operations were originally planned, it was not believed that an icebreaker would be able to penetrate so far up the fiord. Cargo requirements for *Eastwind* were therefore cut to a minimum, and approximately 15 tons of fuel, oil, food, scientific equipment and other stores were to remain at Thule for airlift in the spring of 1958.

A "Canso" amphibian aircraft of 121 Communications and Rescue Flight, RCAF, after calling at Thule Air Base on 6 August, dropped a note to the Lake Hazen party telling them to stand by for evacuation. On

its way over northern Ellesmere Island, the "Canso" radioed back the ice conditions in Conybeare Bay and Archer Fiord. These were so favourable that, after another ice reconnaissance by Captain Rea and L/Commander Croal, it was decided to embark all the expedition supplies for transfer to Hazen Camp by helicopter. From where *Eastwind* anchored in Chandler Fiord, it was a short hop of some 18 miles to Lake Hazen, and only another nine miles across the lake to the camp.

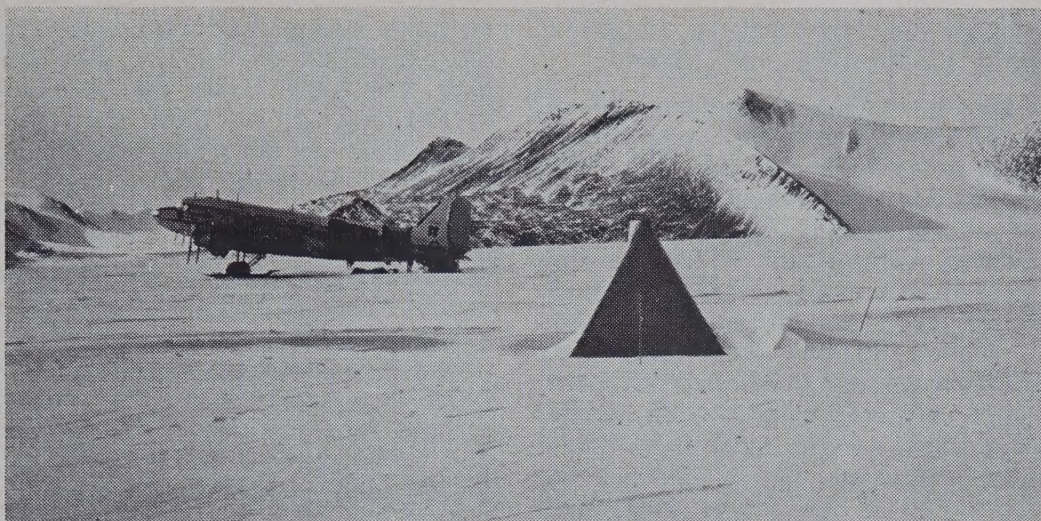
Between 15 and 18 August, *Eastwind* performed outstanding work. The two pilots of the "Piasecki" helicopter, working in shifts, took advantage of every break of the misty weather; the four men of the winter party and 15 tons of supplies were flown into the camp, and eight men, 20 dogs, six puppies and 2000 pounds of records and equipment were flown out. The scared dogs that swarmed out of the "Flying Box-



National Defence Photograph

RCAF C-119 ("Flying Boxcar") on the airstrip on Lake Hazen, April 1958. Johns Island is in the background.





*National Defence Photograph*

RCAF ski-wheel DC-3 on the Gilman Glacier, May 1958. The pyramid tent in the foreground had stood all winter.

cars" on to Lake Hazen in the spring were now seasoned air travellers. One dog worked its way up to the front of the helicopter on the way to the ship, and sitting quietly beside the pilot gazed out of the bubble in a fair imitation of a co-pilot!

On 18 August, *Eastwind* sailed from Chandler Fiord. On the evening of that day, in the difficult ice off Cape Baird, the ship lost a propeller, but this did not prevent the landing of 35 tons of supplies at the Royal Canadian Mounted Police post at Alexandra Fiord. The ship's crew were astonished at the behaviour of some of the scientists who, after a whole summer investigating and living on a glacier, promptly walked up to take a closer look at Twin Glacier while *Eastwind* lay in Alexandra Fiord.

On 20 August, while the icebreaker was still unloading supplies, the crash of one of the "Bell" helicopters on the 800-foot ridge east of the RCMP post was reported. On a bleak, overcast day, with light snow

falling, the Lake Hazen party set out to retrieve the aircraft, which had crashed on the crest of the ridge, and looked like a crippled bird. Its plexiglass dome was smashed, the main rotor blade broken, the tail boom and assembly were twisted, and both pontoons punctured, although fortunately neither pilot nor passenger were injured. After the aircraft had been dismantled, the pieces were carried down to the water's edge, and transferred by LCVP to the ship.

*Eastwind* sailed from Alexandra Fiord on 21 August, and headed for Thule (Kanaq) in Greenland. Here the dogs, which had served the expedition so well, and to which everyone had become attached, were lowered over the side in a most undignified manner into a barge from shore. The icebreaker then sailed for Thule Air Base, and docked there on 23 August. From the air base the party was flown by the United States Military Air Transportation Service to Goose Bay, Labrador,



whence they returned by an RCAF flight to Montreal and Ottawa.

During the second phase of Operation "Hazen", four men wintered at the base camp, and obtained the first continuous meteorological record for an inland station in the Canadian Arctic Archipelago. They were cheered by occasional RCAF aircraft flying over them, and on 8 December a "Flying Boxcar" gave them their Christmas airdrop. Mail, fresh meat, and a Christmas tree, with all the trimmings, were skilfully landed near the camp. On 29 March, the four men of the winter party had their first visitors in more than 6½ months. A United States Air Force C-130 ("Hercules") aircraft, piloted by Major C. E. Fitzwater, USAF, who was accompanied by L/Commander Croal, landed on the frozen lake. The ski-equipped, turbo-prop aircraft brought mail, food, a radio and generator, and 38 drums of fuel.

On 30 April 1958, a "Flying Boxcar" landed at Lake Hazen with a party of eleven, including Dr. Hattersley-Smith and L/Commander Croal. The party also included an Army officer and two sergeants who stayed for about a week. This flight marked the beginning of the third phase of Operation "Hazen". Major T. L. Hoy, a Canadian Army psychologist, examined the four men who had wintered as part of a study of men in isolation, and found them in excellent health and fine spirits. Sergeant Engel and Sergeant J. E. Robertson, Royal Canadian Corps of Signals, ensured that all mechanical, radio and electrical equipment was in full working order before they left.

A ski-wheel "Dakota" of 121 C. and R. Flight stationed at Sea Island, near Vancouver, B.C., landed

at Lake Hazen, and remained with the expedition during the month of May. The crew, under the command of F/Lieut. M. W. Utas, CD, made themselves at home in one of the "Attwell" shelters, and a signpost announced the establishment of an "Arctic Air Command". A memorable party was held one evening at which a can of Peary's alcohol from a cache on the north coast of the island was broached. The spirit with which all members of the aircrew entered into the life of the expedition made their presence both personally and professionally welcome.

The DC-3, which remained with the expedition until late May, re-established the Gilman Glacier camp. Its assistance was invaluable for flying scientific parties to outlying areas and for laying caches.

Gravity stations were established on Ward Hunt Island, at the head of Clements Markham Inlet, and near Greely's old base at Fort Conger. A seismic party was also flown to the ice cap near Mount Oxford, where the aircraft landed and took off at an altitude of nearly 6000 feet. Two field parties with dog teams were flown to the head of Clements Markham Inlet, whence they made geological and survey traverses back to the Gilman Glacier camp. Other flights for scientific and supply purposes were made to a glacier above the head of Tanquary Fiord, since named Air Force Glacier, to Alert and to Archer Fiord.

During the summer of 1958, the work of the first season was expanded. Sledge journeys were made over the ice cap of the interior, the glaciological, geophysical and survey work was extended, and the meteorological and micro-meteorological observations continued. Archaeological



ical, botanical, geological, geomorphological, limnological and zoological studies were carried out by parties working out from the base camp and from the Gilman Glacier camp.

On 4 August, USS *Atka*, under Commander William H. Reinhardt, USN, and with L/Commander Croal on board, sailed from Thule to evacuate the expedition. Once more the services of an icebreaker were available through the courtesy of the United States Military Sea Transportation Service. The ship left nine days earlier than USCGC *Eastwind* in 1957, and difficult ice conditions were encountered on the way north. The ship stopped at Alexandra Fiord, and carried out a complete medical and dental check of the RCMP personnel and two Eskimo families there. On 9 August, *Atka* arrived in Chandler Fiord, after landing a party of American and Danish scientists at Polaris Promontory, Greenland, on the way. Again the transfer of personnel from Hazen Camp to the icebreaker was accomplished by "Piasecki" helicopter without incident.

On 14 August, *Atka* sailed from Chandler Fiord, and, stopping only at Polaris Promontory and Kanaq, reached the Thule Air Base on the 20th. One final service was rendered by the icebreaker when the ship's medical staff presided at the birth of a litter of puppies born to one of the expedition's bitches.

Five scientists had remained at Hazen Camp to complete their work, and secure the camp for the winter. On 20 August a "Canso" aircraft of 121 C. and R. Flight, Air Transport Command, under the command of F/Lieut. E. M. Neill, landed on the lake, close to the station. With a few final touches, Hazen Camp was made ready for winter. The "Canso" then taxied out into the lake with the five scientists on board, and, with a roar of "JATO" (Jet Assisted Take Off), headed for Thule. The I.G.Y. field work at Lake Hazen was over.

In the summers of 1959 and 1960, small parties carried out further studies in the Lake Hazen region, and were taken in and out of the area by the RCAF and USN in 1959, and by the RCAF in 1960.

Before the I.G.Y. and during the years that Operation "Hazen" worked in northern Ellesmere Island, 408 Squadron of Air Transport Command carried out aerial photography of the region. The air photographs were of great value in the field investigations, and in the subsequent analysis of data and preparation of reports.

Operation "Hazen" provided a fine example of the way in which scientists and servicemen can work together in harmony. In the field operations of 1957-58, the services maintained their high tradition of cooperation and assistance in the cause of scientific discovery in the Arctic.





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